

Short-term Prediction Research and Transition (SPoRT) Project Overview

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ABSTRACT

The Short-term Prediction Research and Transition (SPoRT) Project at Marshall Space Flight Center is an end-to-end research-to-operations (R2O) / operations-to-research (O2R) facility that transitions unique satellite datasets and modeling capabilities to National Weather Service (NWS) operational forecasters to address specific nowcasting and short-term forecast challenges (0-48 hours) on regional and local scales. In recent years, SPoRT collaborations have expanded to more than 30 NWS Forecast Offices and National Centers across all six NWS regions. SPoRT's activities have also expanded to include collaboration with NOAA's GOES-R and JPSS Proving Ground / Risk Reduction activities, preparing forecasters for the next generation of satellite capabilities. SPoRT provides experimental imagery and derived products from NASA's Terra and Aqua satellite and the joint NASA/NOAA S-NPP missions to prepare forecasters for new data that will become operationally available following the launch of GOES-R and JPSS. These products include higher-resolution single channel and multispectral imagery products (i.e., RGBs) for low cloud and fog analysis, dust detection, cyclogenesis, and atmospheric stability. SPoRT also supports the use of total lightning information from ground-based NASA Lightning Mapping Arrays, which is preparing forecasters for the Geostationary Lightning Mapper on GOES-R to support severe weather prediction. SPoRT selects projects in consultation with NWS partners, NASA research scientists, SPoRT collaborators, and NOAA's Proving Grounds, ensuring that research to operations activities are aligned with specific forecast challenges, and with the broader goals of NOAA's programs. Activities are prioritized by focusing on satellite products and research outcomes that are broadly applicable to forecast challenges shared by multiple partners – for example, an emphasis on low clouds and fog presents aviation weather hazards of interest to all WFO partners, and the Aviation Weather Center. Through more than 10 years of collaborations with NWS forecasters, SPoRT has established a demonstrably successful R2O/O2R paradigm, resulting in the operational use of SPoRT products by numerous WFO partners. This paradigm involves working with WFOs to develop a transition plan to outline the forecast challenge and products available from NASA and/or NOAA missions to best address their needs, develop training on use of the new products, incorporate those solutions into the user's AWIPS system, and establish norms for providing feedback on the operational utility of the new solution. The transition process is iterative in nature, using forecaster feedback to implement necessary changes to the product solution to better address the forecast challenge. Collaborations are documented through presentations at meetings and conferences, monthly collaboration webinars, and on some occasions, through co-authored articles submitted for peer-reviewed publications.

In FY14, SPoRT conducted four product assessments and two product trials focused on the following areas: nighttime microphysics RGBs for high latitudes, total lightning, soil moisture, and snowfall rate (SFR), quantitative precipitation estimates (QPE) for the tropics, and ozone. Of particular note was the continued partnership between SPoRT and NESDIS to transition experimental products developed at NESDIS (SFR and QPE). Feedback on these product evaluations included 71 blog posts (49 of which were done by forecasters and other NOAA liaisons), more than 120 feedback questionnaires completed by forecasters, and a number of e-mail and phone exchanges. In addition to product assessments, SPoRT continues to be a community leader in the development of new display capabilities for AWIPS II, including participation in the Operations Proving Ground and development of the tracking meteogram tool, which allows for time series of data to be displayed in AWIPS II.

Thus far in FY15, a second iteration of transition activities involving the SFR and nighttime microphysics RGB products has occurred. New efforts include active involvement to develop preliminary multispectral imagery products from the ABI-like instrument aboard the Japanese Himawari satellite for demonstration with Pacific Region collaborating WFOs and an initial evaluation of derived products from the NASA Global Precipitation Measurement (GPM) mission coupled with the soil moisture products for addressing forecast challenges associated with heavy precipitation in the data-sparse Western and Alaska regions. Additional innovative visualization capabilities for displaying RGB imagery in AWIPS II as part of the SPoRT-led Experimental Products Development Team (EPDT) will be also be pursued.